WHAT IS CLAIMED IS:

1. A method for classifying voxels of first and second images generated using first and second echoes of a dual MRI scan, the first and second echoes corresponding to respective first and second sets of image acquisition parameters, the method including the steps of:

providing for accessing first image data corresponding to the first image including an array of voxels, the first image data including a first associated parameter value S1 for a parameter of the imaging associated with respective voxels of the array of voxels;

providing for accessing second image data corresponding to the second image including the array of voxels, the second image data including a second associated parameter value S2 for the parameter of the imaging associated with respective voxels of the array of voxels; and

providing for determining R and θ values associated with respective voxels of the array of voxels, wherein for each respective voxel R substantially equals $(S1^2 + S2^2)^{1/2}$, and θ substantially equals arctan(S1/S2) for S1 and S2 associated with the respective voxel.

2. The method according to Claim 1, wherein the parameter of the imaging is intensity.

3. The method according to claim 1, wherein the first image is a density-weighted image.

4. The method according to claim 1, wherein the first set of image acquisition parameters is configured for acquiring a density-weighted image.

5. The method according to claim 4, wherein the first set of image acquisition parameters includes a repetition time (TR) and an echo time (TE) in a spin-echo sequence, wherein a TR:TE ratio ranges substantially from 67:1 to 150:1.

6. The method according to claim 1, wherein the second image is a T2-weighted image.

7. The method according to claim 6, wherein the second set of image acquisition parameters is configured for acquiring a T2-weighted image.

8. The method according to claim 7, wherein the second set of image acquisition parameters includes repetition time (TR) and an echo time (TE) in a spin-echo sequence, wherein a TR:TE ratio ranges substantially from 20:1 to 38:1.

9. The method according to claim 1, further comprising the step of providing for determining a frequency distribution of respective voxels of the array of voxels over a plurality of corresponding θ values.

10. The method according to claim 1, further comprising the step of providing for plotting a first plot of a first plurality of points having Cartesian coordinates (x,y), each point of the first plurality of points correlating to a respective voxel of the array of voxels, wherein for each respective point of the first plurality of points x is the first associated parameter value associated with the correlating voxel, and y is the second associated parameter value associated with the correlating voxel.

11. The method according to claim 1, further comprising the step of providing for plotting a second plot of a second plurality of points having polar coordinates (radius, angle), each point of the second plurality of points correlating to a respective voxel of the array of voxels, wherein for each respective point of the second plurality of points the radius coordinate is equal to R determined for the correlating voxel, and the angle coordinate is equal to θ determined for the correlating voxel.

12. The method according to claim 11, further comprising the step of providing for filtering the second plurality of points with an edge preserving filter.

13. The method according to claim 9, further comprising the step of providing for plotting a third plot of θ versus frequency distribution.

14. The method according to claim 9, further comprising the steps of:

providing for determining respective peaks in the frequency distribution; and

providing for determining at least one θ value that corresponds to the peaks;

wherein each respective peak is associated with a cluster of voxels of the array of voxels including voxels having an associated θ value substantially equal to the at least one θ value that corresponds to the peaks.

15. The method according to claim 14, further comprising the steps of:

providing for determining a range of θ values for each respective peak bounding the at least one θ value that corresponds to the respective peak, which has a frequency distribution indicative of association with the cluster associated with the peak; and

providing for assigning voxels having an associated θ value that is within the range of the bounding θ values to belong to the cluster.

16. The method according to claim 15, further comprising the step of generating a displayable image of the image data, wherein voxels assigned to each cluster are displayed having a same displayable feature, wherein the feature when displayed is distinguishable from a displayed feature of voxels assigned to a different cluster.

17. A method for classifying voxels of first and second images generated using first and second echoes of a dual MRI scan, the first and second echoes corresponding to respective first and second sets of image acquisition parameters, the method including the steps of:

providing for accessing first image data corresponding to the first image including an array of voxels, the first image data including a first associated parameter value S1 for a parameter of the imaging associated with respective voxels of the array of voxels;

providing for accessing second image data corresponding to the second image including the array of voxels, the second image data including a second associated parameter value S2 for the parameter of the imaging associated with respective voxels of the array of voxels;

providing for plotting a first plot of a first plurality of points having Cartesian coordinates (x,y), each point of the first plurality of points correlating to a respective voxel of the array of voxels, wherein for each respective point of the first plurality of

points x is the first associated parameter value associated with the correlating voxel, and y is the second associated parameter value associated with the correlating voxel; and

providing for determining R and θ values associated with respective voxels of the array of voxels, wherein for each respective voxel R substantially equals the distance of the point correlating to the voxel as plotted in the first plot from an origin of the first plot, and θ substantially equals the angle of a line drawn through the origin of the first plot and the point from a positive x-axis of the first plot.

18. The method according to Claim 17, wherein the parameter of the imaging is intensity.

19. The method according to claim 17, wherein the first image is a density-weighted image.

20. The method according to claim 17, wherein the second image is a T2-weighted image.

21. A system for classifying voxels of first and second images generated using first and second echoes of a dual MRI scan, the first and second echoes corresponding to respective first and second sets of image acquisition parameters, the method including the steps of:

means for accessing first image data corresponding to the first image including an array of voxels, the first image data including a first associated parameter value S1 for a parameter of the imaging associated with respective voxels of the array of voxels;

means for accessing second image data corresponding to the second image including the array of voxels, the second image data including a second associated parameter value S2 for the parameter of the imaging associated with respective voxels of the array of voxels; and

means for determining R and θ values associated with respective voxels of the array of voxels, wherein for each respective voxel R substantially equals $(S1^2 + S2^2)^{1/2}$, and θ substantially equals arctan(S1/S2) for S1 and S2 associated with the respective voxel.

22. The system according to claim 21, wherein the parameter of the imaging is intensity.

23. The system according to claim 21, wherein the first image is a density-weighted image.

24. The system according to claim 21, wherein the first set of image acquisition parameters is configured for acquiring a density-weighted image.

25. The system according to claim 24, wherein the first set of image acquisition parameters includes a relatively long repetition time (TR) and a relatively short echo time (TE) in a spin-echo sequence, wherein a TR:TE ratio ranges substantially from 67:1 to 150:1.

26. The system according to claim 21, wherein the second image is a T2-weighted image.

27. The system according to claim 21, wherein the second set of image acquisition parameters is configured for acquiring a T2-weighted image.

28. The system according to claim 27, wherein the second set of image acquisition parameters includes a relatively long repetition time (TR) and a relatively long echo time (TE) in a spin-echo sequence, wherein a TR:TE ratio ranges substantially from 20:1 to 38:1.

29. The system according to claim 21, further comprising means for determining a frequency distribution of respective voxels of the array of voxels over a plurality of corresponding θ values.

30. The system according to claim 21, further comprising means for plotting a first plot of a first plurality of points having Cartesian coordinates (x,y), each point of the first plurality of points correlating to a respective voxel of the array of voxels, wherein for each respective point of the first plurality of points x is the first

associated parameter value associated with the correlating voxel, and y is the second associated parameter value associated with the correlating voxel.

31. The system according to claim 21, further comprising means for plotting a second plot of a second plurality of points having polar coordinates (radius, angle), each point of the second plurality of points correlating to a respective voxel of the array of voxels, wherein for each respective point of the second plurality of points the radius coordinate is equal to R determined for the correlating voxel, and the angle coordinate is equal to θ determined for the correlating voxel.

32. The system according to claim 31, further comprising means for filtering the second plurality of points with an edge preserving filter.

33. The system according to claim 29, further comprising means for plotting a third plot of θ versus frequency distribution.

34. The system according to claim 29, further comprising:

means for determining respective peaks in the frequency distribution; and

means for determining at least one θ value that corresponds to the peaks;

wherein each respective peak is associated with a cluster of voxels of the array of voxels including voxels having an associated θ value substantially equal to the at least one θ value that corresponds to the peaks.

35. The system according to claim 34, further comprising:

means for determining a range of θ values for each respective peak bounding the at least one θ value that corresponds to the respective peak, which has a frequency distribution indicative of association with the cluster associated with the peak; and

means for assigning voxels having an associated θ value that is within the range of the bounding θ values to belong to the cluster.

36. The system according to claim 35, further comprising means for generating a displayable image of the image data, wherein voxels assigned to each cluster are displayed having a same displayable feature, wherein the feature when

displayed is distinguishable from a displayed feature of voxels assigned to a different cluster.

37. A computer readable medium storing a set of programmable instructions configured for execution by at least one processor for classifying voxels of first and second images generated using first and second echoes corresponding to respective first and second sets of image acquisition parameters, the programmable instructions comprising:

means for providing for accessing first image data corresponding to the first image including an array of voxels, the first image data including a first associated parameter value S1 for a parameter of the imaging associated with respective voxels of the array of voxels;

means for providing for accessing second image data corresponding to the second image including the array of voxels, the second image data including a second associated parameter value S2 for the parameter of the imaging associated with respective voxels of the array of voxels; and

means for providing for determining R and θ values associated with respective voxels of the array of voxels, wherein for each respective voxel R substantially equals $(S1^2 + S2^2)^{1/2}$, and θ substantially equals arctan(S1/S2) for S1 and S2 associated with the respective voxel.

38. A computer data signal embodied in a transmission medium for execution by at least one processor for classifying voxels of first and second images generated using first and second echoes of a dual MRI scan, the first and second echoes corresponding to respective first and second sets of image acquisition parameters, the data signal comprising:

a code segment including instructions for providing for accessing first image data corresponding to the first image including an array of voxels, the first image data including a first associated parameter value S1 for a parameter of the imaging associated with respective voxels of the array of voxels;

a code segment including instructions for providing for accessing second image data corresponding to the second image including the array of voxels, the second image data including a second associated parameter value S2 for the parameter of the imaging associated with respective voxels of the array of voxels; and

a code segment including instructions for providing for determining R and θ values associated with respective voxels of the array of voxels, wherein for each respective voxel R substantially equals $(S1^2 + S2^2)^{1/2}$, and θ substantially equals arctan(S1/S2) for S1 and S2 associated with the respective voxel.